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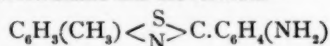
A NEW PHOTOGRAPHIC PRINTING PROCESS—"PRIMULINE."

AT the late meeting of the British Association for the Advancement of Science, at Leeds, the chief event, from a photographic point of view, was the paper read by Mr. A. G. Green before the Chemical Section (B), entitled, "The Action of Light Upon the Diazo Compounds of Primuline and Dehydrothiitoluidine: A Method of Photographic Dyeing and Printing." Wherein he made known a new process, in which primuline, a recently-discovered coal-tar dye, was used to produce photographic prints of an entirely new character. The following particulars we glean from the *Photographic* (London) *News*.

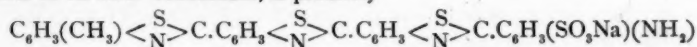
In his paper Mr. Green, speaking for Charles F. Cross, Edward J. Bevan and himself, states, viz.:

In the early part of 1887 one of us (Green) discovered that, by heating paratoluidine (2 mols.) with sulphur (4 to 5 atoms) at 200° to 300° C., a very complex amido base was obtained, which, on treatment with fuming sulphuric at a low temperature, was converted into a sulphononic acid, the alkaline salts of which were easily soluble in water, and had the peculiar property of dyeing cotton primrose yellow from an alkaline or neutral bath without the use of a mordant. Further, the amido compound thus fixed upon the fibre could be diazotised *in situ* by passing the material through a weak solution of nitrous acid, and, when diazotised, could be combined with various phenols and amines, thus producing a variety of different colors, which, being formed within the fibre, were all distinguished by great fastness to washing. The soluble amido sulphononic acid was named "primuline" by its discoverer, and has found a very extensive employment in cotton dyeing; the colors produced from it within the fibre were called "ingrain colors."

Although the chemical constitution of primuline base (of which primuline is the mono-sulphononic acid) has not yet been determined with certainty, there is no doubt that it is a condensed derivative of dehydrothiitoluidine, a body which always accompanies it in its formation, and that it differs from the latter in exactly the same way as dehydrothiitoluidine itself differs from paratoluidine. As there is scarcely any doubt that dehydrothiitoluidine has the formula—



i.e., is an amido-benzenyl-amido-thiocresol, it follows that the formula of primuline, or rather of its chief constituent, is probably



In a similar manner, by heating metaxylinidine or pseudocumidine with sulphur, homologues of primuline are obtained, which, like primuline itself, dye cotton without a mordant, and can be diazotised and combined with phenols within the fibre.

It has long been observed by one of us (Green) that the diazo compound of primuline was very sensitive to the action of light, being readily decomposed thereby, and losing its property of combining with phenols and amines. Upon this fact we have now founded a photographic process, by means of which designs can be produced in fast colors upon cotton, silk, wool, linen, or other fabrics. It can also be applied to wool, xylonite, celluloid, paper, or to gelatine films upon glass, thus affording a very wide range of employment. The process, which is a very simple one, merely depends upon the fact that if a material containing diazotised primuline be exposed to light under a design, those parts which are acted upon by light will be decomposed, whilst the parts protected from the light will remain unaltered, and consequently, on subsequent development with a phenol or amine, will produce colors, whilst the decomposed portions will not. The details will, of course, depend somewhat upon the material to be treated. As an instance, we may take the production of a design upon cotton cloth, cotton velveteen, and so on. The material is first dyed with primuline from a hot bath containing common salt until the required depth is obtained. It is then washed and diazotised by being immersed for a quarter of a minute in a cold bath containing about $\frac{1}{4}$ per cent. of sodium nitrite, and strongly acidified with sulphuric or hydrochloric acid. The material is washed again, and exposed damp—or, if preferred, after having been dried in the dark—to the action of light beneath leaves, ferns, flowers, or other natural objects, or beneath glass or transparent paper upon which may be painted or printed any design which it is required to copy. Either the arc electric light or daylight may be employed; in the latter case, the time of exposure will, of course, vary with the intensity of the light,—under half a minute is required in bright sunshine, and nearly half an hour in very dark, cloudy weather. When the decomposition is complete, which may be readily ascertained by means of a test slip exposed simultaneously, the material is removed from the light, and either passed into the developing bath at once, or is kept in the dark until it is convenient to develop it. The developing bath consists of a weak solution ($\frac{1}{4}$ to $\frac{1}{2}$ per cent.) of a phenol or amine made suitably alkaline or acid, the phenol or amine employed depending upon the color in which it is required to produce the design, thus:

For *red*, an alkaline solution of β naphthol.

For *maroon*, an alkaline solution of β -naphthol-di-sulphonic acid.

For *yellow*, an alkaline solution of phenol.

For *orange*, an alkaline solution of resorcin.

For *brown*, a solution of phenylene diamine hydrochloride.

For *purple*, a solution of *a*-naphthylamine hydrochloride.

If it is required to produce the design in two or more colors, the respective developers, suitably thickened with starch, may be applied locally by means of a brush or pad. After development the material is thoroughly washed, and requires no further fixing.

Linen, silk, and wool are treated in exactly the same way. Paper for copying drawings, and other purposes, is coated on the surface with primuline by means of a brush or roller. For the production of gelatine films upon glass the primuline is incorporated with the gelatine before being applied to the glass.

In place of ordinary primuline the homologues already mentioned may be used. For silk and wool the primuline may be replaced by dehydrothiitoluidine-sulphonic acid, by means of which colorless backgrounds may be obtained.

Concerning the reaction which occurs when the diazo-primuline or the diazo-dehydrothiitoluidine is decomposed by light, we cannot at present say anything definite, except that the diazo group is completely destroyed, for on treatment with sodium hydrosulphite (true hyposulphite) it cannot be converted into the amido group (reforming primuline or dehydrothiitoluidine). The reaction may consist in a replacement of the N_2 group by OH or by H, or may be even more complex. Although we cannot affirm that this reaction to light is a property of the diazo-compounds of this group of bodies only, yet it is certain that they possess an extreme susceptibility to light far greater than that of other diazo-compounds, whilst at the same time they are far more stable to heat. It is thus possible that this property may depend in some way upon the sulphur which they contain.

Mr. Green also gave a demonstration of the process to the Section. An enameled iron basin contained about three pints of water kept nearly at boiling temperature by means of a Fletcher's gas-burner below, and into this he projected, without weighing, a few grains of primuline, a light yellow powder, and, aided by stirring with a glass rod, it quickly dissolved. He then took a piece of white cotton cloth, perhaps 12 by 10 inches in size, and pushed it below the surface of the liquid by means of the glass rod. In one or two minutes the cloth was dyed light yellow. Then it was lifted from the liquid by the rod, and thoroughly washed in water; the surplus water was next wrung out of the cloth by hand, and the damp cloth placed upon a white backing in the printing frame, beneath a translucent, flexible colored picture, such as used in windows in imitation of stained glass. When it is desired to obtain a print of a purple color the cloth, after the washing, is soaked in a mixture of a solution of nitrite of soda and acetic acid; this soaking somewhat deepens the yellow color. The operations so far occupied five or six minutes.

The printing frame and its contents were then exposed at a window for ten minutes to rather dull daylight; there was no sunshine. The print was then developed by immersion for less than a minute in the solution described; then it was washed in water, and the whole operation would have been finished, except that in this instance, in order to fix the purple color, which otherwise would have been liable to be acted upon by alkaline agents, it was passed through a bath of tartaric acid. The whole of the operations, from first to last, occupied about twenty minutes on a dull day; with sunshine but one minute's exposure would have been necessary, thereby reducing the total time to eleven minutes. The developer used in producing a purple color has an evil smell.

Next a contact print, by artificial light, was made in about five minutes upon a dry plate which had been coated with a solution of primuline in gelatine. The time of exposure was five minutes to the lime light in front of an ordinary optical lantern condenser.

The colors produced by this process are not gaudy, but of an "artistic" nature, resembling those which predominate upon Indian silks. As yet a white ground to the prints has not been obtained, but a light gray, approaching to white, has been produced. For many subjects this absence of white is no drawback, because the pictures look as if intentionally colored by hand; in fact, such power of producing colors in untouched photographs has never before been seen. One picture represented a classical head of large size against an artistic yellow background; the

general result was excellent, and no one could have imagined a week ago that such a result could possibly have been produced by photography.

Numerous prints in various colors by this process were exhibited; some of them were on glass which had been coated with primuline dissolved in a solution of gelatine; others were upon paper, cloth, and various fabrics; most of them were of rather large size.

In relation to the action of the spectrum upon the new substance, Mr. Green stated that the decomposition is far more general over the whole spectrum than is the case with silver salts; although the action is greatest in the violet, it is fairly strong as far as the orange. He could not give a definite solution of the problem as to the nature of the chemical change produced by light, but could state that it is certain that nitrogen is set free; he thought it probable that some of the residue formed entered into the cellulose or gelatine vehicle; at all events, when no organic matter is present, the decomposition produced by light is relatively excessively slow. In gelatine the nitrogen eliminated is locked up for some time, certainly for a day, and when the exposed gelatine film is placed in water, bubbles of nitrogen are given off.

Those present at the reading of the paper displayed a lively interest in its contents and in the demonstration. Mr. John Spiller, whose remarks will be found in last Wednesday's *Times*, stated that Mr. Green had not alone been the discoverer of primuline, but of the second stage of its application to photographic purposes. Mr. Spiller farther stated that he himself had been working with primuline upon paper, and had found it to be quite as sensitive to light as ordinary chloride of silver; he had tried to get an image upon it in the camera, but had obtained no result in ten minutes. The coloring matter in the finished print—say, the red color—he believed to be wonderfully permanent; it was not affected by light, by acid, by alkali, nor by a variety of metallic salts, but was attacked by hydro-sulphides. The new process, he thought, was likely to run the blue process very hard for engineers' drawings.

Among those present at the meeting was Professor Rowlands, of the United States, who has been so successful in the production of diffraction gratings. He asked whether the new substance had been tried for the orthochromatizing of ordinary gelatino-bromide plates. Mr. Bothamley replied that it had never been so tried, but that only ten minutes previously Mr. Green had given him some primuline for the purpose.

In the course of this interesting meeting, Professor Thorpe, who presided, remarked that it was a curious fact that just thirty-two years ago, when the British Association was previously at Leeds, the inventor of the blue process, Sir John Herschel, occupied the chair in which he, Professor Thorpe, had just been listening to the description of a new process which Mr. Spiller had said was likely to "run the blue process hard."

So far as can be judged at present, the "running of the blue process hard" is one of the smallest things the new process is likely to do, for it gives a power never before seen of photographically producing colored results, some of which may be artistically harmonious, and others the reverse. Ere a few months have passed away the merits and demerits of the primuline process will have been largely investigated by practical photographers, and it seems probable that some of the classes of pictures it is capable of producing will arrest the attention of the general public to an unusual extent.

BLITZ PULVER vs. FLASH LAMP.

AS the season of the year has now arrived when flash-light pictures will be again in order, the following account will be read with interest by both amateur and professional photographer, who may have occasion to use it. As will be seen "Blitz pulver" maintains its superiority over all the so-called magnesium flash-lamps.

Prof. Eder, of Vienna, has lately instituted a series of experiments, seeking to establish the relative rapidity of the various flash-compounds, as well as the different apparatus, which have been brought into use for igniting the metallic powder. For this purpose he constructed an ingenious apparatus. This consisted of a toothed wooden wheel, similar to the scape wheel of a clock; on the periphery a small silvered glass globe was secured, such as are used to decorate Christmas trees. To this wheel a pendulum is attached, so that when set in motion the wheel moves similarly to the escapement of a clock; each swing of the pendulum being equal to one second of time. The silvered globe was photographed by the various compounds and apparatus, the result being the arc described by the ball. The length of which naturally depends upon the duration of the source of illumination, the following results were obtained:

Duration of Flash.

1. Blitz pulver (containing 40 parts pure magnesium), charges of about 15 grains, ignited by means of a taper, $\frac{1}{20}$ to $\frac{1}{80}$ sec.
2. Pure magnesium powder, blown rapidly into a spirit-flame with aid of a glass tube; charge of 7 grains pure magnesium, $\frac{1}{8}$ second.
3. Pure magnesium powder ignited in a "Schirm" lamp; charge 4 grains magnesium forced rapidly into the axial of the flame by a slap on the air-bulb with both hands, $\frac{1}{4}$ second.
4. Pure magnesium powder, ignited in a "Von Loer" apparatus: this is a kind of double blast arrangement, by which the magnesium is forced into or through the flame; the charge was 8 grains, and registered, $\frac{1}{4}$ second.
5. Pure magnesium powder burnt by Dr. Hesekei's method: about 4 grains were used for a charge, the flash lasting $\frac{1}{15}$ second.

This method is nothing more than throwing the powder into or down the chimney of an ordinary kerosene lamp,—an experiment which the translator is free to acknowledge he has not had the courage to try.

As will be seen by above comparison the Blitz pulver is far in advance of the much vaunted flash-lamps, Blitz pulver being the only method by which great intensity, actinic action, and absolutely instantaneous effects may be obtained. One of the most astonishing facts brought out by these experiments is the one showing that Dr. Hesekei's simple method distances, by great odds, the most elaborate and complicated apparatus devised to produce actinic illumination for photographic purposes by igniting plain magnesium powder.

J. F. S.

TO SUTTON'S ISLAND WITH A CAMERA.

TOOT, toot, too-oo-oot, a shrill whistle blows. It is the *Ralph Ross* announcing her presence. She is a cute little steamer that we have engaged to take us on an excursion to Sutton's Island. She hauls up to the slip, and we are soon comfortably stowed on board of her. The captain deftly shoves her off, sets the miniature but active engine in motion, and seizing the steering-wheel sends us cutting swiftly through the clear blue sea. Shortly we approach the United States school-ship *St. Mary*, lying at anchor in the roadstead. The weather having been rainy previously, she has all her canvas loosed to dry in the glowing morning sunshine. She presents a beautiful picture, and one rarely to be seen nowadays. She is the glorious old sloop-of-war in all the completeness of half a century ago; and with her great black sides high above the water, far-projecting channels, and gaping port-holes, from which protrude the old-fashioned cannon, square stern with cabin windows, bluff bow with all the quaint carvings of the old billet-head, great overhanging davits and swinging booms, and towering above all, her lofty masts and wide-reaching yards, with picturesquely-festooned sails, she forms a picture that we *must* secure; so as we approach we lay anxiously hold of our camera, set the shutter, and draw the slide. Our captain, perceiving our intention, asks whether he shall stop; we answer no, and catching our subject in the fonder wait until the exact moment; a slight click is heard, we have her,—this time on the bow. It is but a moment's work to re-adjust our holder and set the shutter; now we find her once more; click, we have her again,—a stern view; and soon she vanishes to a mere speck, and we bend our attention upon Sutton's Island, which we are rapidly approaching.

Sutton's Island is one of the group of islands which lie off the southerly side of Mount Desert, and is remarkable on account of its precipitate, rocky shore, the rest of the group being low and shelving to the water, so as not to present anything of prominent scenic interest. We approach the southerly side, which is the lowest, and make our landing,—a matter not just the easiest of accomplishment, because the tide is low, and the crazy old wharf, having lost one the planks which forms its open stairs, has a gap which can only be overcome by aid from a slightly-projecting cleat and a liberal use of the arms on a rude rail above. All is wet and slippery, and the sea is flopping and swirling beneath; but with great care and the aid of the captain we get our party, consisting of wife, maid, and two baby boys, safely on shore.

On gathering together our traps and looking about us, we find ourselves surrounded by fine, picturesque subjects. To our right, before we have yet left the wharf, we see a picture in a gray, weathered old shed or boat-house and a fine group of rocks. We do not wait to set up our tripod, but secure it at once by "snap-shot." Then advancing a few yards to the left, we come upon a sloop hauled up for repairs, backed by an old shop and surrounded by lobster pots, a dory, a sail hung over some barrels, and a number of other picturesque accompaniments,—all that the most enthusiastic lover of the unsophisticated could wish. Here again we secure two views, one from either side. We would gladly have had more, but as we are not supplied with roll-holder and films we must use our plates sparingly.

We now wend our way around the westerly end of the island; sometimes along stony beach, at others climbing with difficulty over the jagged, slippery, many-colored

rocks, here festooned with masses of sea-weed, and there coated with innumerable barnacles, now overhanging us, now jutting out into the sea; and then along thin bits of pasture-land bordered by rude stone walls, till we find ourselves on the summit of the northernmost shore, amongst stunted pines, hoary with lichens and long, pendant gray moss, and looking from a series of rocky precipices, some sixty to eighty feet above the sea, over the sound to the magnificent mountain panorama which the island of Mount Desert presents from this point. The day is serene, and we are utterly charmed. Our delight is only tempered by the feeling of regret we have that a few near and nature-loving friends are not with us to share our enjoyment. To those who have not traveled amongst fine scenery and drunk in such enchanting scenes, it is utter folly to attempt to describe the exquisite charm of a view from an eminence overlooking sea and mountains, with rocky foreground, such as we have in this instance, and we may find even in greater perfection upon the west coast of Scotland, where all is upon a grander scale, and the mountain torrents and ruined castles add greatly to the interest. Added to the varied and grandly picturesque forms in such scenes, we have the exquisite coloring, possessing, as it does, a force and brilliancy which cannot be approached in painting, let alone attempted in description. The delicate azure of the mountains, the intense blue of the sea, and the glowing reds, oranges, and browns of the rocks about us, contrasted and heightened by small coverings here and there of the most brilliant green herbage,—what a picture! Alas! we cannot fix it. We must enjoy it when presented to us, and bear what we can of it in recollection, using it to fill out the descriptions we may afterwards read of fairy scenes amongst far-off ocean islands. Whilst we pursue our work with camera, wife goes to interview the owner of this tract which commands so fine a prospect, and renew an acquaintance made a year previously with the good lady, who, we are sorry to say, has since become a widow. The family have long been residents here, and have gained a livelihood, as do most in in this region, partly from the scanty soil and partly as "toilers of the sea." We had hoped to make a purchase, but find that we have too long delayed our project. A land company had been upon the ground last winter and *boomed* it. What we might have purchased a year ago for four hundred dollars per acre we are now asked double that amount for. We are enthusiastic over the spot, but eight hundred dollars per acre for rocks and precipices is beyond our sense of prudence. So we sigh, and must wait for a decline.

Pursuing our search for views, in making a detour to avoid a too dense wood on an overhanging crag, we come suddenly upon three or four lonely graves. (It has been the custom in this region for families to bury on their property.) They are just at the border of a tract of pine wood, where it begins to open out a little. The trees are dwarfed, old, and moss-grown,—weird-looking; the ground stony; not a blade of grass grows on the heaped stony gravel which forms the mound over each grave. There are neat marble head-and foot-stones, with the usual inscriptions upon the former. From one I learn that the grave contains the remains of a young wife, buried in 1856, aged sixteen. Entirely alone, I paused, impressed by my sudden happening upon this lonely burying-place, and entered into a reverie upon the strangeness of the chances that befall human existence. Who could not have done so? There lay the remains of one, doubtless in life blooming in health and youthful beauty, cut off

at the instant of commencement of the duties of wife and mother. More than three score and ten years of the joys and sorrows, fears and hopes, of a long life blotted out at its beginning. For thirty-four years has that lonely grave existed, unchanged by summer sunshine and winter ice and storm. What events have transpired during that time! What great wars! First that of France and Austria with its bloody Solfarinos and Magentas, then our own long and bitter strife, and following that the Franco-Prussian, with the overthrow of a flourishing empire. How many mothers' hearts have been wrung! What strange events have transpired! Great earthquakes, great fires, great floods, and a thousand other matters to stir the human soul. Quietly through it all has slept in that lonely grave, on this little island, those remains. Yet peaceful as it seems, we all struggle to remain in the strife.

Awakening from the sad train of thought into which we have been thrown by this unexpected scene, we clamber down to the base of some perpendicular cliffs, and pursue our work with camera in a grand confusion of rocks; but now we encounter some photographic mishaps. Our subject is nearly entirely in shadow, and so dark in local tone that we must make a time exposure. Having no footing for the tripod, we attempt a view by holding our camera as firmly as we can upon a jagged rock and using the time working of the shutter; but alas! the shutter sticks when half-closed, and the plate is spoiled, and the next attempt fares no better; for having incautiously drawn the slide before setting the shutter, the latter from some unaccountable reason, exposes the plate before we have pointed the camera at the intended subject. But in justice to the maker of our excellent outfit we must say that we have ourselves only to blame. We were too busy to make ourselves familiar with its peculiarities before setting off upon our journey.

Having expended our supply of plates, and the time coming around for our departure, we get our little party together at the landing to await the arrival of our steamer. After a while we think we see her, the merest speck in the distance. But we are not sure. We watch and wait, in the meantime making notes upon the exquisite coloring of the scene about us. The speck grows and grows. It is the *Ralph Ross*. But if the conditions of our landing were not altogether as perfect as we might have liked, those of our departure promise even less favorably. Any one unacquainted with the enormous tides of this locality, would not dream of the importance which they assume in the daily routine of longshore business. The watching and waiting for favorable conditions of wind and tide in rowing and sailing cause much to do with both sea-farers and pleasure-seekers. Boats, at the same place, are afloat one part of the day, and a mile or two from the water at another.

During our sojourn upon the island, the tide has so far receded that the bottom plank of the rickety old steps which we made use of in the morning, is now some ten feet above the water. So as the steamer approaches, we find that it will be necessary to go out to her in a small boat. In addition to this a strong southwest breeze has sprung up, making this the rough side of the island. However, by good management we succeed in getting on board safe and dry. But now the captain of the little bark is anxious to get an offing. It is a question whether he will not go upon the rocks before sufficient headway is got. A full head of steam is up, the engine starts, and we just barely manage to draw off. But we have not proceeded a mile when the motion of the engine begins to die out. We are tossing and pitching about

in the little sea. The captain explains that water has become mixed with the oil which furnishes the heat to our boiler; but a supply of fresh oil does not seem to remedy the difficulty. So now he says that a dead stop must be made for an examination. We eye anxiously the rocky shore, not very far from us,—the dreaded "lee shore" of nautical phraseology,—and wonder what our chances will be. Fortunately, the vessel being low, we find we do not drift very rapidly; and the investigation bringing forth a stopped-up tube, which is soon cleared, we resume our voyage, in twenty minutes or so, at a rate of speed which would do credit to some of "Uncle Sam's" new cruisers. We feel now that we have had just enough of adventure to give spice to our trip, and land at our hotel in good spirits and with good appetites, for you will perceive that we have entirely omitted the usual lunch-basket accompaniments of such excursions.

XANTHUS SMITH.

"AT HOME" PORTRAITS AND GROUPS.*

MR. HARRISON, who is so well known as a skillful and practical operator, and is not to be confounded with a gentleman of the same name and initials who is associated with the literary side of the *Photographic Review*, says:

There are many difficulties in this work which do not present themselves in the ordinary glass room or studio. I need scarcely say that one of the greatest is the scarcity of light, and not only the scarcity, but also the directness with which it enters the apartment, coming generally from one or two small windows. If, in order to get sufficient light, we find it necessary to place the sitter near the window, then the effect is hard in the extreme: shadows black as ink, with never a bit of detail visible. It is well to place the sitter back if there be room, so that the light enters the apartment in front of the face, thus modifying the contrasts a little. The windows are generally found profusely draped with curtains, often of a thick material, admitting little or no light. Even when they are of lace, it is quite common to find them so deeply dyed with saffron that the light which does struggle through possesses little actinic power. By all means have them pinned well back to the sides of the window. Our patroness may demur when she sees what we are about, but if we explain the necessity of the proceeding, and give her the assurance that we will exercise great care in our preparations, she will soon be won over.

Having now a strong light and dark shadows, we must resort to reflectors; and for this purpose I have found nothing better than an ordinary bed-sheet.

This should be very carefully placed not too far back, so that the reflected light as well as the direct may come pretty well from the front.

A portable stand for supporting the reflector may easily be made out of few feet of round deal about an inch in diameter, cut into suitable lengths, and joined by means of ferrules as used for fishing-rods.

The end supports should appear like the letter V inverted, with a rod of the same material along the top, either end of which rests on these end supports. The sheet can be thrown over this stand in the same fashion as the washer-woman has previously placed it on the clothes-line to dry. In fact, our reflector-stand is little more

* From Bolas' *Photographic Annual* for 1890.

than a portable clothes-horse; yet it will be found of great service. If we are not supplied with some such article, we often experience a difficulty in attaching the corners of the sheet in a suitable position. Of course this arrangement can be moved to any part of the room when required. A similar contrivance is useful for placing a plain background when vignettes are required, the wall-paper often being unsuitable for that purpose.

The reflector-sheet should be of ample size, so that it may be spread out on the floor, as well as placed upright on the stand.

Where the window is very small and the general tone of the room dark, additional light may be gained by placing a large reflector outside the window. We have all noticed the effect in our rooms, when the ground and surrounding buildings have been covered with a layer of snow. How it fills the apartment with light! In a lesser degree we may gain the same effect by the use of an outside reflector.

Many exceedingly pretty effects in lighting are to be obtained in an ordinary drawing-room.

Amongst others I would mention specially the kind of picture known amongst photographers as the Rembrandt. When light and shade are correctly balanced, this is a most pleasing and artistic style of photograph, and one in great demand.

It is more especially suited for studies of the head and bust than for three-quarters or full-length portraits, except when our sitter is attired in white; then the details of the drapery are sometimes more easily rendered by the figure being placed in shadow.

In order to produce a successful Rembrandt, it is of the first importance that we pay careful attention to the matter of lighting, that we may have a correct proportion of light and shade. If the light be strong and direct, then we must have much reflected light; if weak or more diffused, a lesser amount of reflection will suffice. In all cases we ought to avoid reflected light being used in such a manner that it can be detected in the resulting picture as such. It is desirable that the reflecting sheet be not placed too near the face of the sitter, and that it be brought fairly well to the front. The operator will do well to make a final inspection and overhauling of the lighting previous to exposing the plate, in order that any defects, which on a close inspection are discernible, may be rectified, such as false lights reflected in the eyes, heavy shadows caused by prominence of the nose, etc.

When exposing on such a picture, the great amount of shadow ought to be taken into consideration, and a due allowance made in the length of exposure. The two most common causes of failure in Rembrandts are violent contrasts of light and shade, and under-exposure. For home work, the one has to be overcome by a judicious use of reflectors; and the other by an exposure, the duration of which our experience and judgment must determine.

It is desirable to be provided with a vignette background, the wall-paper frequently being of so conspicuous design as to be altogether unavailable for the purpose. Even when the paper is quite plain there are sure to be shadows on it near the window, which make vignetting a difficulty. In choosing a background, select the lightest you can find, remembering that the weaker light of the drawing-room requires a lighter background than is necessary for the studio.

Let the roller be attached to the top of background, with a cord for hanging, like a map or picture.

I find it more convenient to dispense with the rod or lath at the bottom, as it is so constantly in the way.

By providing ourselves with an extra stand, as described last week, we have the choice of two methods of hanging the background. Sometimes the stand will be useless, on account of the limited space behind the sitters; and at other times it will be desirable to use it: as, for instance, when the background is required away from the wall.

Never attempt this kind of work with a view lens when you are the possessor of a portrait lens. The latter is far and away the better. When we take into consideration the small amount of light with which we have to work, the frequent demand for the photographing of children "at home," and the necessarily close proximity of the sitter to the background, and other articles more or less obtrusive, we shall readily see that a view lens is not suited for the purpose.

When photographing a full-length portrait or group, the background is often quite unobtrusive if rendered by a portrait lens; but if a view lens is used it is glaringly objectionable. The same applies to picture-frames, vases, curtains, etc.

With regard to accessories, the drawing-room usually abounds with them, and I have never experienced any difficulty in this direction. Flowers, grasses, and other articles useful in the making up of pictures are often more abundant here than in the average studio. With fresh accessories and home-like surroundings, new and natural poses suggest themselves; and the work, as far as posing and picture-making is concerned, is a delight. If we are photographing children, the children know that they are at home; and the freedom of speech and action allowed at home are difficulties far less than the inquisitive conduct of the older, and the half-terrified condition of the younger, members when visiting the strange studio.

To insure success, be provided with a quick-acting portrait lens and plates of the greatest rapidity (combined, of course, with the other qualities which contribute to a good plate); then the difficulties are half overcome.

A plate which gives a full round image, with abundant detail in the shadows, without being unduly forced, is the class of plate to be used for the work.

In making the exposure, the operator should not forget to take into consideration the color of the wall-paper, carpets, hangings, etc. When there is a fair amount of light in the room it is often robbed of much of its actinic power by the yellow or red tone of the room, and is quite misleading to the inexperienced.

Under exposure, being the most common fault in photographs taken under these conditions, ought to be studiously avoided, hence I would again urge that every available assistance to rapidity be made use of.

Perhaps groups are the most trying subjects we met with. The inequality of the light is a cause of great trouble. In a group of eight or nine persons those farthest from the source of light are but dimly lighted, and that end of the plate will require very much more exposure than the opposite. A sheet placed on the carpet near them, in addition to the side reflection, will somewhat assist to equalize matters; and if the cap of the lens be taken off and replaced in such a manner as to give the shorter exposure to the side nearer the window, the difficulty is still further reduced. The rest must be done in development and after-treatment of the negative. Personally, I like a slow development, and think my readers will grant the desirability of its adoption for this class of work.

Large groups ought not to be attempted indoors, unless the room be exceptionally large and well-lighted. If the apartment be but badly lighted, it is preferable to photograph the group out of doors, or at the studio.

Parlor portraiture is suitable for single figures and small groups, but when a group numbering more than seven or eight individuals is required to be photographed, not only is the lighting a difficulty, but trouble is also occasioned by the limited space available between sitters and camera.

It is well to have a short focus lens by us; it will often help us over a difficulty otherwise insurmountable.

I well remember the trouble I once experienced in photographing a group of seven or eight persons and a dog in a very moderately-lighted drawing-room, being supplied only with a rectilinear lens.

Fortunately the room was long, so I had no difficulty in getting well away from my subjects; but the length of exposure necessary and the restlessness of my canine sitter combined to make the task anything but an easy one.

As I have previously remarked, the time of exposure in drawing-room portraiture is very prolonged. Due consideration should be given to this fact when posing, more especially with children, and positions chosen in which the temptation to move is reduced to a minimum. In grouping children, for instance, it is often advisable to place the heads together so that one forms a slight support for the other. Sitting positions, for the same reason, are usually more successful than standing; in fact, experience gained in the bygone days of slow plates and long exposures will be found of great service in selecting positions in which it is easy to keep still. This is a matter which, in these times of instantaneous photography, is to a great extent lost sight of.

To return to the subject of apparatus, I would advise my readers to equip themselves as lightly as possible. It is most fatiguing to be compelled to carry a heavy head-rest and studio camera-stand, in addition to the other indispensable apparatus, up the quantity of steps one sometimes has to ascend.

The studio camera-stand is altogether unnecessary. The ordinary tripod answers the purpose quite as well if corks be placed on the spikes in order to protect the carpet.

I would recommend a tripod, the height of which may be regulated at will by the well-known sliding arrangement. The head-rest should be as light as is compatible with stability. A good stock of dark slides is very convenient, but provision should also be made for the changing of plates.

The use of a room, which can be temporarily darkened, is generally placed at the disposal of the photographer; but it is well to be provided with some form of changing box or bag, many of which are in the market.

Many opportunities of doing business will present themselves in connection with evening parties, masquerade balls, bazaars, exhibitions, etc., whereby, if the operator can work successfully by artificial light, he may increase business during the winter months.

The demand for night photography is very great, and there opens up before us almost unlimited scope for good work in this direction.

It must remain for the enterprising reader to use whatever form of artificial light he chooses. It is not my intention to enter more fully into that subject in this paper.

I have now tried to bring before my readers some of the advantages and difficul-

ties of drawing-room portraiture, and have recommended the methods of making the most of three advantages, and overcoming the difficulties, being the while guided by my own experience.

Perhaps some of my remarks will not be found to be in accordance with the views held by many photographers. We all know that each operator has his own pet methods of working, and some there are who are very conservative in these matters; yet if any, after wading through my remarks and observations on this subject, obtain any fresh views which prove of after service to them, I shall consider myself amply repaid for any effort which I have made.

W. H. HARRISON.

THE USE OF THE CAMERA AND PHONOGRAPH IN THE STUDY OF ETHNOLOGY.

HOW the various inventions of modern times vie with one another as to which shall prove of the greatest service to the scientific world in matters of research and investigation, as well as permanently recording the results, and how quickly these different discoveries are adapted to the various branches of the sciences, becomes more apparent every day. One of the latest schemes has been to supplement the camera with the phonograph in the field of ethnology. Where the first with its sensitive film portrays the features and depicts the various domestic scenes and utensils, the latter is now called into requisition to record for time to come the speech, songs, and sayings of such aboriginal races as are now rapidly losing their original characteristics through their contact with the European and civilized races.

Such an effort is at present being made with reference to the American Indians, *i.e.*, such tribes which still remain in approximately the same condition that they were when first visited by white men. Although it is almost impossible, at the present time, to find such tribes within the confines of the United States, there are still a few which have been very little changed; we allude to the Pueblo Indians, who still possess many interesting features of great antiquity. Of all the Pueblos, except possibly the the Moquis, the Zuñians, or A'sheewee as they are called in their own tongue, have been least changed from their original condition by contact with the Europeans. Living at a distance from the railroad, inhabiting isolated regions difficult of access, these people have preserved the ancestral traditions and customs in their primitive form. In many ways they offer an unparalleled opportunity for study of the religious and secular celebrations of the Pueblo Indians, but slightly modified from the olden time. The result of this attempt to place on record the features, customs, songs, ritual, and prayers of this curious aboriginal race is embodied in the following interesting communication from J. Walter Fewkes to the *American Naturalist* for July:

A previous visit to Zuñi, in the summer of 1889, had inspired in me a wish to attempt to record on the cylinders of the phonograph the songs, rituals, and prayers used by these people, especially in those most immutable of all observances, sacred ceremonials. I was particularly anxious to record the songs connected with the celebration of the mid-summer dances, which occur at or near the summer solstice. By the help of Mrs. Hemenway, of Boston, it was possible for me, in the interest of the

Hemenway Expedition, to visit Zuñi Pueblo at this time, and I have been fortunate enough to take on phonograph, from the lips of the Zuñians, a series of records illustrating the songs used in their sacred and secular observances. An extended paper, with illustrations of the dances, has been prepared for publication, and will be printed as soon as the music can be written out by an expert from the cylinders of the phonograph. Although I prefer not to publish my final contribution until the illustrations are prepared from my photographs, a brief notice of some of the phonographic records which I have may not be without interest.

One of the most interesting songs sung at this dance, which is called the Kea' kok' shi or good dance, is that of the Kō kō. This song I took directly from one of the participants in the dance. I have reason to believe that this song is improvised each year, as the music this summer is quite different from that of a year ago. I was told by the Zuñians before the dance that they did not know what the song was to be, and that no one knew except the participants. There is, however, a general resemblance, yet still great variety, in all these "Kō kō songs," and I have indelibly taken on phonographic cylinders as many as possible for a comparative study at a more favorable opportunity.

Four days before the dance, on the afternoon before the departure of a delegation of priests to offer feather plumes at the "Sacred Lake," Tay jay po une, a ceremony takes place in the Pueblo, which may be called the "Ducking of the Clowns." This observance is known to the Dumāchimche, from the words of the song by the Ko ye a mashi, or mudhead clowns, on whom, in the course of the celebration, water is poured from the house-tops by the squaws. This song has internal evidence of antiquity, and I am told by the Indians that both song and ceremony are very ancient. Although a musical critic might not find in it great beauty, as an undoubted specimen of ancient aboriginal music it is very interesting. I shall comment on the meaning of the Dumāchimche in another place, when the ceremony will be described at length.

While my observations have been particularly directed to the linguistic features of the solstitial dances in summer, I have not wholly neglected the great wealth of other material all about me for linguistic study by means of the phonograph.

The well-known celebration called the Sha' la 'ko, at which the Zuñi house is consecrated, is the occasion of an elaborate ceremonial, in which figures a song or chant and a prayer, said to be very ancient. I have never witnessed the celebration of the Sha' la 'ko, but have been able to obtain the chant and prayer from one of the natives. This capture had to be made secretly, unknown to the other Indians. It was found necessary to take it late at night, in a room darkened with blankets at the windows to prevent suspicion, and sentinels stationed about the house to warn us of the approach of intruders. On those conditions only was it possible to get the Indian to chant the Sha' la 'ko on the phonograph. It is now, however, permanently recorded in the wax, and can be reproduced at pleasure, or, what is of more importance to philological study, can be written out and studied at leisure, under better conditions. I am told that it is next to impossible to get any of the Zuñians to sing the Sha' la 'ko out of season, and as the celebration regularly comes in November, a record of it in July is a fortunate acquisition. Certain of their winter songs they will not sing in summer, because to do it prevents the corn

from growing. I do not know whether or not the chant of the Sha' la 'ko is one of these.

The phonographic record to which I look forward with the greatest hope is that of a Zuñi ritual, to which writers have from time to time referred. This ritual, which has been designated by the dignified title of a Zuñi Epic, is of considerable length, and is regarded with great reverence by the Zuñi people themselves. Haluta, the reciter of it at the time of its delivery, is said to be regarded as a most sacred personage; and when, prior to its recital, he is brought into the Pueblo, his feet, it is said, are not allowed to touch the ground. It is thought probable that a phonographic record of the ritual would be an addition to our knowledge of Zuñian mythology. The extracts from this ritual, which are freely translated from memory by Mr. Cushing in his interesting paper on Zuñi Fetishes, indicate that it is a valuable account of the mythological history of the race. He had not at his command an instrument to record the words of those portions of the "Kaklan" which he heard, and consequently was unable to give it in the original diction in which it is given before the members of certain priesthoods, to whom alone it is recited. He says that many of the words are in old Zuñi, not understood at present. The records which I have are good enough to enable me to write out the ritual, which, however, at the present state of my knowledge of the language, I am unable to translate. With the help of those who understand the language, as well as English, I have no fear but that in my final paper I can publish a translation of the ritual as told by Haluta on the cylinder of the phonograph.

I have, after several failures, been able to get this recital on the phonograph, where it fills a long series of cylinders. Before the value of this record, both linguistic and mythological, can be appreciated, it must be carefully written out and studied. This will take a long time, as many of the words are old Zuñian, and the task of extracting the meaning from the ritual will be found to be a difficult one. A permanent preservation of it is, however, a step in the interpretation, and when once indelibly fixed on phonographic cylinders its true character and significance can be investigated.

One of the most interesting of the Zuñi songs is that of the hunters. This song has many beautiful parts in it, and outside of its interest in the study of the customs of the hunters, is well worth preserving as a specimen of aboriginal music. I have thought it worthy of a place in my collection, and with it I have also preserved certain of the prayers to the fetishes used in the hunt, some of which have been written out and translated by Mr. Cushing. The harvest which a study of the hunting customs of the Zuñians offers is great; and the collection of data bearing on this subject is highly important, since the decrease in game may go on, as New Mexico is more and more thickly settled, and the hunting ceremonials be more or less modified as time goes on.

I have not encountered, in my experience in taking records with the phonograph, any great difficulties among the Zuñians. Their real impressions of the instrument it is very difficult to divine. One of them asked if a person was hidden in the machine, and another thought the phonograph bewitched.

Indians are so stolid that it is very difficult to discover what impression such a novel instrument as the phonograph makes. They are so accustomed to incompre-

hensible machines used by Americans, that this last triumph of inventive genius affects them no more than many others which might be mentioned. Certainly they are not afraid of it, and there is no difficulty in getting them to talk into the instrument.

The great difficulty in getting them to repeat their sacred songs and prayers does not come so much from their fear of the instrument, as of secularizing what is sacred to them.

They will readily respond with any of their secular songs, or with those sung in public, but those belonging to the secret ceremonials of the Estufa they will not divulge.

REPRODUCTION OF LIGHT BY ELECTRICITY.

ONE of the latest scientific discoveries of this wonderful age is said to be an apparatus which bears the same relation to the eye that the phonograph does to the ear. We reproduce the article in full without comment:

It is said to be possible that modern electricians may succeed in constructing a device that will do for the sense of sight what the telephone does for the sense of hearing, but the prospects for such an achievement are not particularly bright. The possibility has been demonstrated, experimentally, but the practical difficulties in the way of carrying out the idea are very great. It is well known that certain salts of copper and silver, for example, generate electric currents when exposed to the light; and, conversely, electric currents will produce in these salts changes corresponding to those made by light. If a strongly illuminated object is placed in front of a transmitter covered with such a salt electrical currents will be generated which will vary in intensity according to the intensity of the light falling on different parts of the surface. If, now, these various currents were carried to a receiver similar to the transmitter they would produce on its surface changes like those wrought by light on the surface of the transmitter. According to the *Electrical World* an apparatus has been proposed based upon the property peculiar to selenium, that its electrical resistance changes with the intensity of light. For a transmitter the selenium cells are arranged in squares like a checker-board. The greater the number the more efficient would the apparatus be. Each of these is connected with an electro-magnet in the receiver. The latter is composed of a mirror constructed of thin strips of steel, to each of which several of the electro-magnets are attached. A strongly illuminated body being placed in front of the selenium transmitter the electrical resistance of the various cells varies in accordance with the intensity of the light, as in the case of the salts of copper and silver. The various currents affect electro-magnets in different degrees, the result being that the strips of steel are bent irregularly, turning the mirror into an aggregation of surfaces, very slightly warped, which will throw an image on a screen. The main difficulty in the way of the realization of such an idea as seeing by electricity lies in the necessary complexity of an apparatus which shall enable innumerable points in the transmitters and receivers to be actuated simultaneously in perfect independence, and also in perfect correspondence, but it is quite possible that further experiment will bring into actual use what might be something more than a mere plaything. In defensive war a telescope of indefinite length would certainly be of value. With buried wires and concealed visors a general might watch his adversary's movements at times when this would mean victory instead of defeat.—*Iron*.

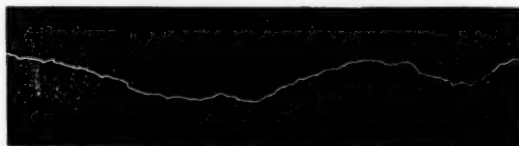
PHOTOGRAPHING THE ELECTRIC SPARK.

AT a recent meeting of the London Photographic Society Sir Henry Trueman Wood read a paper on photographing the electric spark. He referred to the instances in photographs in which bright flashes of lightning were represented by dark lines in the position. These dark flashes were noticeable in photographs of lightning flashes of which reproductions appeared in the *Western Electrician* of July 26th. They were not as plainly marked, however, in the engravings as in the photographs. Sir Henry Trueman Wood said it had been suggested that the dark lines might be due to oxides of nitrogen, produced by the flash and remaining in its path,



the line of nonactinic material thus produced appearing in the photograph against the background, illuminated perhaps by subsequent flashes. The paper continues as follows :

The idea occurred at the time to myself, and probably to a good many others, that the matter might be solved by means of the Wimhurst induction machine, the powerful sparks of which form no bad imitation of lightning flashes. Mr. Clayden probably settled the matter as to the way in which the "black flashes" were produced by taking photographs of the spark and exposing the plate before development to diffused light, when darkened lines were the result, thus showing, it must be admitted, to the surprise of many, myself among the number, that it was merely a case of reversal of the image. I had not the chance of using a Wimhurst machine



until a short time ago, but I thought it would be interesting to try whether one could get anything which would justify the theory. It seemed to me that if the plate were exposed immediately after the passage of the spark against an illuminated background, supposing the spark marked out its passage in the air, as has been suggested, then some record ought to be found on the sensitive plate. I made a good many trials to this end, making the exposure immediately I could see the spark, which, of course, was really after it had passed; but I was not able to discover the faintest trace of anything on any of the plates exposed. Subsequent experiments, however, showed that it was very easy to get the image of the spark, either in its usual condition or entirely reversed, if the spark was photographed with an illuminated background behind it, and the exposure on the background continued for a sufficient time after the passage of the spark; or if, when the spark was photographed against a

dark background, a subsequent exposure to an illuminated background was made. The illuminated background was simply a screen of tissue paper with an arc lamp behind it. It was placed a few inches behind the terminals of the machine. The cuts show the most perfect reversal was obtained by a preliminary exposure of two or three seconds, and a subsequent exposure of about five. By a still longer continued exposure a re-reversal took place, and the spark in the print was again indicated by a white line. There were also many cases of partial reversal, in which the

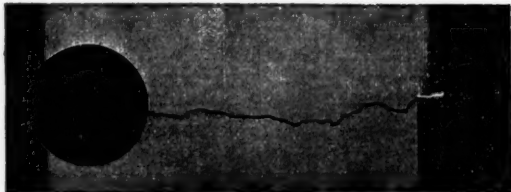


image was reversed at one end and not at the other, or reversed at the sides and not at the center. That is to say, the positive print showed a white central line or core, bounded by dark edges. It appears a rational conclusion that in these cases the reversal had commenced along the sides, but had not reached the center.

Where a background was employed, of which half only was illuminated and half dark, the reversal took place only in that portion of the spark which had behind it the illuminated portion.

All the experiments, it appears to me, go to confirm the theory put forward by Captain Abney, and elaborated by Professor Meldola, as to the cause of the reversal of the photographic image,—namely, that the bromine set free by the action of light begins, as soon as a certain quantity has been liberated, to combine with the reduction product originally formed, thereby forming fresh bromide of silver, and re-sensitizing the portion of the plate where the effect is produced.



It may be worth mention, as a reminder to those who may be inclined to try experiments with the Wimhurst spark, that the analogy between it and the lightning flash must not be pushed too far. For instance, when some photographs were shown in which the lightning flash was shown broadened out by motion of the

camera, it was naturally objected that photographs of the induction spark taken on a rapidly-revolving plate, showed no apparent movement. The observations which Mr. Preece has caused to be taken in thunder storms by the post-office telegraph instruments, indicate that lightning flashes have often a duration of definite amount, quite sufficient for movement of the camera to blur or enlarge the photographic picture.

Another interesting result obtained by photographing the electric spark is that a measure of its duration may be obtained. I am able to show you some photographs of the spark taken on a rapidly-rotating plate. The plate, or film, for many of the photographs were taken on paper, was mounted on a disc which was rotated by an electro motor at a speed in some cases exceeding 2,000 per minute. The largest disc was 20 inches in diameter; the smallest about 4 inches. Of course, the larger the disc the greater the circumferential speed, but in practice the motor I was using could not drive the large discs at a very high speed, and the greatest speed I got was with a disc of 8 inches in diameter (effective) running at 1,500. This gave a speed of 600 inches per second at the point when the outer end of the spark was photographed. There is no perceptible difference in the width of a spark taken when the plate is stationary and that of one taken when the plate is running full speed, and certainly it is not displaced to the extent of the twenty-fifth of an inch. It follows from a simple calculation that it does not last the 10,000th part of a second.—*Western (Chicago) Electrician*.

TRUE COLOR VALUES.

RENEWED attention has of late been called to this subject, in Europe as well as in this country. In the current number of the *Photographische Nachrichten* (No. 36) Dr. F. Stolze publishes an elaborate and exhaustive paper on the subject, in which Dr. Stolze pays the following tribute to the latest publication of our fellow-townsmen, Mr. Fred. E. Ives, viz.: "Through the labors of Veress, in Klausenburg, the question of photography in natural colors has of late been stirred up; while on the other hand Fred. E. Ives, as shown in No. 35, aims to solve the problem in a different manner. The direct method proposed by Veress has not, up to the present time, produced an actual solution of the question; consequently from that standpoint his method must be considered a failure, and it is questionable whether the results promised will ever be obtained by his process. On the other hand, it cannot be denied that Ives has made a complete success in the solution of the problem, at least for lantern slides; and here we can positively state that, theoretically, the process is correct, and if sufficient care is exercised in the required conditions it is possible to reproduce a picture colored true to nature by means of a projecting lantern."

This acknowledgment, coming from so high an authority in the field of photographic research as Dr. Stolze, must be encouraging to Mr. Ives, and spur him on to attain still greater results in the future, which we will be glad to publish. We regret that lack of space prevents us from reproducing Dr. Stolze's paper in full in the present issue.

J. F. S.

ELEVENTH ANNUAL CONVENTION OF P. A. OF A.**PHOTOGRAPHIC APPARATUS AND MATERIAL EXHIBIT.**

IT is to be regretted that the space provided for the stock exhibit was so limited as to preclude many dealers from obtaining space. Every foot of space was filled, and the exhibits were tastefully arranged in the ante-room outside of the lecture-hall, as well as in the larger room provided for the purpose. One pleasant feature, which it is to be hoped will be continued, was the throwing open of this as well as the art exhibit to the public, during parts of the week. It has always seemed to the writer that if moderate-priced admission tickets to our annual exhibitions were issued, the general interest would be much increased and the finances of the association not curtailed.

There was rather a dearth of new inventions in apparatus. One of the most prominent features of the stock-room proper was the really fine display of pictures shown by the dry-plate makers.

The Cramer Plate Works showed a general line of portrait work by about forty photographers. The pictures of Enoch Arden, by McMichael, in the Art Exhibit, and the statue pictures by Hardy, of Boston, were also made on the Cramer plates, showing its fine qualities for rapid portraiture. The Seed Co. displayed finely-lighted large portraits by Baker, of Columbus, Ohio, original poses by Max Platz, of Chicago, and beautiful work on white backgrounds by Roesch Bros., of St. Louis. Very noticeable also was a fine set of views and cloud-effects taken from Mt. Hamilton, Cal., by Prof. S. W. Burnham, of the Lick Observatory.

The Eagle, Allen and Rowell, and Standard plates also made a display, and the Harvard Co., while not making an exhibit, were well represented by the genial Mr. Nash.

The Knorr Mfg. Co. showed a fine collection of pictures, which were in contest for the prize for the best prints made on Diamond albumen paper; this was awarded to Rose, of Providence, R. I. They also had a full assortment of papier-maché trays and other specialties, under the care of the assiduous Geo. Bates, Jr.

The Blair Camera Co.'s well-known manufactures were fully represented, including the justly-celebrated Hawk-Eye Camera.

A novel feature of the exhibition was a beautiful collection of photographs on china, burnt in, by Benjamin Bros. & Werner, of Cincinnati.

J. W. Bryant and his able assistant, John Sullivan of LaPorte (not Boston), were kept busy in one corner of the hall taking orders for and keeping in motion their backgrounds on wires. We congratulate Mr. Bryant on the improvement in the design and execution of his grounds from year to year.

E. & H. T. Anthony & Co. had their usual fine exhibit of apparatus, including large portrait cameras.

The local stock dealers were well represented by E. J. Pullman with a general line of photographic goods.

Among the improvements of apparatus deserving special notice may be mentioned a new self-adjusting time and instantaneous shutter by the Kalamazoo Shutter Co.

The Acme Burnisher Co. showed a new eight-inch burnisher meant specially for amateur use; also a full assortment of their machines, which have become a standard article.

Wilson-Hood-Cheyney Co., of Philadelphia, had a tastily-arranged exhibit of drapery curtains and Osborne's accessories.

Among the other exhibits may be mentioned Packard Bros.' accessories, Entrekin's burnishers, and B. French & Co.'s celebrated Euryscope and Darlot lenses.

L. W. Seavey occupied a balcony on the second floor of the museum with his backgrounds and accessories, and attracted and entertained visitors by an orchestra stationed in one corner of his space.

In the ante-room to the lecture-hall were several exhibits of note. The Eastman Co. demonstrated how "you press the button, and we do the rest," and the general capabilities of the transparent films—*when you can get them!*

The A. M. Collins Mfg. Co. were represented by Messrs. Hastings and Janes with a full line of their standard cards. Their excellent and original designs for printing and lithographing mounts would suit the taste of the most fastidious photographer, and the quality of their cards continue to be unsurpassed. Bonte, of Chicago, had an exhibit of foreign card mounts. Hetherington's tall figure was prominent in this room, among his well-known accessories and fancy backgrounds.

In the lecture-room was a very fine display of work done by the air-brush, showing its capabilities in skillful hands of very close imitation of the finest crayon and pastel work.

A. E. MARIS.

DEVELOPING.

READ AT THE WASHINGTON CONVENTION OF THE P. A. OF A.

DURING the past year there has been little change in the methods of development. Pyro still stands as the favorite, although several substitutes have been used and suggested.

Eikonogen has advanced in favor, many of the dry-plate makers giving eikonogen formulæ for use with their plates. I have used it with great success in short exposures, and my experience with it is, that you can afford to give one-third less exposure than for pyro; and I feel sure that one cause of the complaint that sufficient intensity cannot be obtained with eikonogen arises from over-exposed plates and new developers; for a plate exposed for pyro development will be over-exposed if developed with freshly-mixed eikonogen.

This was proved to my entire satisfaction upon some Eastman films exposed in a No. 2 Kodak on Decoration Day, when the light was very bad for snap-shutter exposures.

The first twenty exposures were developed with the potash pyro developer known as Hoover's developer, a developer which I have handled most successfully upon all kinds of exposures; but they proved so hopelessly under-exposed that I put the other part of the roll aside, thinking it was not worth the trouble to develop them. But Dr. Weigal, one of the members of our Camera Club (an ardent experimentalist), brought me some eikonogen developer he had mixed, and I developed the rest of the films, and got at least one-third more out of them than I got on the

first twenty with pyro development; and some of them (all things considered) making good printing negatives. Dr. Weigal's formula for mixing the eikonogen developer is 48 grains of eikonogen dissolved in hot water; add to that 2 ounces each of a solution of sulphate of soda (hydrometer test 60) and carb. soda (hydrometer test 45); then add enough water to make up 8 ounces in all.

For over-exposure this developer can be restrained with bromide of potassium, the same as pyro. For snap-shutter exposures this is the best developer I know.

The potash pyro developer (Hoover's) I have referred to is too well known to need the formula being given more, but I would again call attention to the method of using the sulphate of soda. In the majority of formulæ it is divided between the pyro solutions and the potash of soda solutions.

This is wrong in both theory and practice. If it requires four atoms of sulphate of soda to one atom of pyro to get the best effect from both, then it stands to reason that the whole of the sulphate should go into the pyro solution. If you could always be sure of using exactly the same amount of each solution, then it might be divided; but even then there would be no advantage in dividing it. But where different exposures and subjects require first more pyro, the balance of 4 to 1 is being continually upset.

Why is it that so few photographers on this side of the Atlantic use liquor ammonia as an accelerator, instead of potash or soda? There are a few, and those few among the best-known names who produce high-class work, who do use it; but they are the exceptions.

The deposit caused by ammonia is exceedingly fine, the softness and gradations everything that can be wished, and you can get more out of a given exposure by ammonia than any other alkali. But few photographers like the color of the deposit, which is greenish gray, and they are generally deceived by the apparent thinness of the negative. But I think if photographers would only get over the idea that they want their dry-plate negatives to approach as near as possible in color to a wet-plate they would find many advantages in the use of ammonia. For copies for enlarging upon bromide papers there is nothing can beat an ammonia-developed negative.

If photographers want a wet-plate color and effect, why do they neglect the oxalate developer? Many German and French photographers of the highest rank have used oxalate from the first, and still continue to use it. With a full-bodied plate, that is, one rich in silver bromide, and particularly one which contains a small proportion of sodide of silver, the oxalate developer gives fine results, and the old wet-plate man can delight his eyes with a negative which very nearly resembles a wet collodion plate. In many cases I have been able to use oxalate upon a plate that with pyro has been hopelessly spoiled by green fog.

G. CRAMER.

TO MODIFY A NEGATIVE WITH TOO INTENSE CONTRASTS.—Cover the back of the negative with a coating of collodio-chloride, then expose to the light, at the bottom of a deep box, the image in front so as to obtain a positive image on the back of the negative. After fixing and washing print in the usual manner; the presence of the positive softens the contrasts.—*Bulletin de l'Association Belge.*

EXPRESSION OF FORMULÆ IN PROPORTIONATE VALUES.

EDITOR AMERICAN JOURNAL OF PHOTOGRAPHY:

DEAR Sir:—The publication of your "Old Mill on the Crum," in last number of JOURNAL, suggests a subject of interest to me, and which I think would interest others also.

In attempting to compare the formula given for developing "Our Illustration" with that I use, the absurdity of the present method of stating photographic formulæ is clearly apparent. Certainly what the operator must know is the composition of the solution actually applied to the plate, not that of the stock bottle. Now the Washington developer contains:

Hydroquinone,* 1.125 per cent.

Eikonogen, 1.5 "

Pyro,75 "

Which proportion, in the hands of experts, have proved the best average.

Now in order to find out what the real relations are of the new formula for orthochromatic plates, we must make the following calculation. (See p. 265, Sept. number).

I.—GIVEN FORMULA AS PUBLISHED.

| | Grains. | Per Cent. | Actually Used. |
|-----------------------------|---------|-----------|----------------|
| Pyro, 2 drs. | 120 | 6.0 | .40 |
| Citric acid, 15 gr. | 15 | .75 | .05 |
| Oxalic acid, 15 gr. | 15 | .75 | .05 |
| Water, dist., 4 oz. | 1920 | 100.00 | |

II.

| | | | |
|------------------------------|------|--------|------|
| Carb. soda, 3 oz. | 1440 | 30.00 | 4. |
| Sulphite soda, 3 oz. | 1440 | 30.00 | 4. |
| Water, dist., 10 oz. | 4800 | 100.00 | 100. |

III.—PROPOSED FORMULA.

| | | | |
|--|------|--------|--|
| Sulphite of soda, 5 dr. | 300 | 8.0 | |
| Eikonogen, 45 gr. | 45 | 1.2 | |
| Hydrochinone, 15 gr. | 15 | .4 | |
| Water, dist., 8 oz. | 3840 | 100.00 | |
| Potassium carbonate, 1 1/2 dr. | 90 | 2.4 | |

PARISIAN FORMULA (P. 232.)*

| | | |
|--------------------------------|------------------|---------------|
| Sulphite soda | 100 gr. | 10. per cent. |
| Hydroquinone, | 15 gr. | 1.5 " |
| Hydroquinone, | 5 gr. | .5 " |
| Potassium carbonate, | 50 gr. | 5.0 " |
| Water, | 1000 gr. | 100. " |

And as the carbon compounds are the active agents in development, we have the following strengths: .4, .75, 1.125, 1.6, and 2 per cent.; the first two pyro, the last two mixed eiko. and hydroquinone. Now it appears to me no other method is possible to give an exact idea of the composition of developers in such a way as to

* Hitchcock, see *Anthony Bull.*, 1889, p. 71.

* The Parisian formula was not mentioned in connection with the orthochromatic plates, as it had not proved satisfactory.—ED.

render comparison possible. I have no doubt some will say, start with the term, thirty grains to the ounce. You will find about the same number of figures required, and even more difficulty in avoiding errors. I believe the first journal of photography that begins printing all their formulæ in per cent, of the strength actually used will add thereby to its reputation.

Do not think I am grumbling at you. I only want to push for what I think an improvement.

Yours truly,

WM. H. SEAMAN.

Washington, D. C., September 9th, 1890.

HAND-CAMERAS.

A DISCUSSION recently took place before one of the societies which had for its subject "The Use and Abuse of Hand-Cameras," under which description are all the various patterns of "detective" instruments which have been devised to delight the eyes of those who aspire to photography, and to vex the souls of others. The gentleman who opened this useful discussion very rightly deplored the danger which, he thinks, exists in the deterioration of picture-making generally by the adoption of a system which at one fell swoop does away with tripod-stand, rising-front, swing-back, and other appliances which accomplished photographers have hitherto regarded as necessary joints in their armor. That the use of the hand-camera has become greatly extended during the last few months there can be no question at all; but that there is reason to suppose that its appearance has stopped the use of the older form of instrument to any important degree, or that masters of the craft are sacrificing the apparatus with which they have done so much good work for a contrivance which, at the best, is limited in its applications, we must altogether refuse to believe.

Were it possible to take a census of those who purchase this new machine we should, we feel certain, find that the buyers of hand-cameras are mostly those who take up photography because it is just now the fashionable craze. If the fashion had taken the form of pea-green hats or sky-blue shoes, the hand-camera would have been left unnoticed by these butterflies of life. They care not for art, for they possess not the type of mind which can appreciate art; but they can no more afford to leave the last new craze alone than they can afford to miss the annual exhibition of the Royal Academy, or any other show or "function" to which the society fetich which they worship has set its approving seal. If they thought that the acquisition of the ar involved any real trouble or the need of exertion, it would, perhaps, have been different; but the cunning dealers have met them half way, and have whispered to them, "You push the button, and we do the rest."

It is a comfortable way of acquiring a new accomplishment to dispense with any drudgery in connection with it, and photography seems to these recent aspirants to fame to be unique in the ease with which it may be learnt. "Touch the button," that is all; no need is there even for a button-hook. How different is it from acquiring the art of singing, with its practising at scales and endless intervals,—a laborious business which, after all, may end in the discovery that you have no ear. There is no royal road either to water-color drawing, for you must know something about per-

spective and the theory of color before you can paint well enough even for a charitable bazaar; but with this charming new acquirement, which is patronized by society, you merely touch a button, and somebody else is kind enough to do the rest.

It is quite evident that those who take up photography merely because they regard it as "the thing to do" will never be able to turn out good work. They may produce a decent picture once in a way, for, as we all know, flukes are not confined to the billiard table; but the majority of the plates or films which they expose by the touch of that magic button are, in the nature of things, predestined to failure. The touch of the button—which they look upon as the chief, if not the only, manipulation necessary—is in reality the last of a series of important operations, and the only one which is simply mechanical in its nature. The first operation is to *see* a picture in that which lies before us; and the number of those who have no eyes for such things is far greater than those who lack ears to guide them in singing a melody correctly. Then come the questions of distance, sufficiency of light, to say nothing of the knack of holding the camera level, and pointed in the right direction to include the required subject. To the thoughtless buyer of the touch-button contrivance these are simple things to surmount, and it will not be until some one else has "done the rest" that he will find out his error. He takes no heed of anything beyond the mere mechanical part. He sees something which he fancies will give him a first-class picture,—an open landscape, a grove of trees thick with shadows, or even the interior of a room, it does not matter which,—all is the same to him; he merely has to press the button. Then the plates or films are sent to the dealer, who must do his best to coax an image out of them, or to satisfy his customer that there is no image there to coax.

There is no doubt that this new type of photographic worker—or, rather, player—has been born of the hand-camera; and, while we feel inclined to smile at him, as we did last year when, from the same laudable motive, he took to banjo playing, we must acknowledge that he is harmless, and is, to some extent, serviceable. He will not, it is true, advance the progress of photography one jot, nor will he produce any picture worth looking at. His self-imposed task will not give birth in his mind to any fresh ideas; but he will spend money on his transient hobby, and in that way he will do good. So let them play at being photographers, and spend their money on apparatus as freely as they like. The hand-camera is not a dangerous weapon like the revolver, for if the shots do not hit the target, they do not go astray. In the meantime, the real workers will keep to their old ways, although they are ready enough to acknowledge the great value of a hand-camera when used with knowledge and discretion.—*Photo. (London) News.*

COMPLETE ELIMINATION OF THE HYPOSULPHITE OF SODA FROM POSITIVE PRINTS ON ALBUMENIZED PAPER.—After first washing in abundant water, plunge the prints for a few moments into a solution of table salt at 5 per cent. Prolonged washing should follow this immersion, and this is best done by placing the prints on a glass plate and exposing them to a jet of water under pressure, repeatedly turning them.—*Bulletin de l'Association Belge.*

THE USE OF THE COLOR-SCREEN WITH PLAIN PLATES.

WE have received the following interesting communication from a valued correspondent, who is an active member of the Lynn Camera Club, as well as Electrician-in-Chief of the Thomson Electric Welding Company:

LYNN, MASS., August 2, 1890.

EDITOR AMERICAN JOURNAL OF PHOTOGRAPHY:

In the August number of the AMERICAN JOURNAL OF PHOTOGRAPHY I notice an article upon the use of the screen with orthochromatic plates. Permit me to make a few remarks with regard to a statement contained in the article mentioned. The writer shows considerable experience with orthochromatic plates and their adjunct, the yellow screen. I would state that I have had no experience whatever with orthochromatic plates, but have employed, with what would seem to be some success, the yellow screen in connection with ordinary plates, and was therefore somewhat astonished to see the statement, page 235 of the JOURNAL, "I have often heard it said, and often seen it written, that a yellow screen gives an iso- or orthochromatic effect with an ordinary plate. My opinion of a man who says this is that he is not a fool, but a deliberate fibber, if not worse. No one who has ever tried this once would ever make the statement. And I most emphatically deny that a yellow screen has any effect on an ordinary plate, except to make the negative worse than it would otherwise be." It is probably true that with orthochromatic plates and a yellow screen the best results are obtained, but it seems to me a little hasty to deny the effects of the screen used in connection with the ordinary plates. It is, without doubt, difficult to obtain a clear horizon on distant views, not to speak of cloud effects, and my experience has been that what is entirely impossible without the use of the screen can be obtained by using it and the ordinary dry plate, with sharp definition of the horizon and even beautiful cloud effects.

The orthochromatic plates are rather expensive, and there is some uncertainty connected with their use, while, as they are sensitive to yellow light, they require careful development. The ordinary amateur is much more familiar with the use and treatment of ordinary plates, and, judging from my experience, will find the yellow screen a valuable adjunct. There are certain views which will make its use almost a necessity. I enclose herewith a print of a negative obtained on a Cramer 30 plate, with a 10-second exposure, on a Bausch & Lomb lens; stop, 64 U. S. The print will speak for itself. I am positive that I could not have, without the use of the yellow screen, obtained the negative from which this print was taken.

Yours truly, HERMANN LEMP.

We reprinted the statement complained of without comment at the time, and will say that, taken separately, it is certainly misleading, as the writer of the original article must have used weak or unsuitable screens. It is a well-known fact that if the screen used in connection with the ordinary commercial dry plate is sufficiently intense yellow to absorb all or nearly all the blue and violet rays, the effect will be similar, or nearly the same, as that obtained on the commercial orthochromatic plate used with a very thin screen. The accompanying print certainly shows that our correspondent has a suitable screen for his purposes, as well as an extraordinary lens, to produce the effect with the short exposure mentioned.—Ed.

AMATEUR EXPERIENCES, VII.—AN ACCIDENTAL MEETING OF THE L. C. C.

EDITOR AMERICAN JOURNAL OF PHOTOGRAPHY:

AS corresponding secretary of the Leopardville Camera Club I received the following circular, viz.:

A CONVENTION OF AMATEURS.

The Syracuse Camera Club, by resolution adopted August 8th, authorized its president to issue the following address to the various amateur photographic societies of America:

In order to diffuse a more widely-spread scientific interest in the science of photography, and to promote social intercourse among the amateur photographers of America, your attention is called to the desirability of a convention of American amateurs at an early date.

To promote this enterprise you are invited to name a date and place when a delegate from the Syracuse Club may have the honor of meeting yourself or any delegate from your club, with a view to a preliminary organization.

An early reply is solicited. Yours respectfully,

ARTHUR P. YATES, *President.*

WALLACE DICKSON, *Secretary.*

Address P. O. Box 173, Syracuse, New York.

Unfortunately, the circular arrived the day after the regular meeting of our club; but recognizing the importance of prompt action in the premises, I concluded to bring the matter before the club on the first occasion I should meet enough members to form a quorum for business. For this opportunity I did not have long to wait; as I dropped in at the Leopardville Cross-Roads Store, on the following Thursday evening, I found, as I had expected, more than enough of our members present to organize an "accidental meeting." On my arrival, our old deacon (he of the pin-hole camera) was on the stool within reach of the open cracker box, without which no country store can succeed. Mr. Rochester Ross was gathering up the stray cheese crumbs which had fallen outside of the cover, while Brother Fogg and our president, the Rev. W. A. Lense, had ranged themselves within easy reach of a tray of evaporated prunelles. The president, however, was engrossed in the practical working of the patent dry-beef chipper, and somehow every time the reverend gentlemen would drop the lever, a thin shaving of luscious beef would be the result. Our fair and amiable secretary, Miss Carrie Kase, and Master Fritz, the fortunate possessor of an 18x10 Waterbury, had met at the candy counter, and were mutually trying to settle on the flavor of the confections within reach through the broken pane of glass. There were a number of other persons present, but with these we have nothing to do. After stating my business, the president requested the deacon to call the meeting to order. In response to the deacon luncheon was suspended, the communication was read, and commented on. During the reading the party in the store were joined by the Rev. Hercules Lamb, the president of the "Turkeytown Tripod Club," who, after he had finished his preliminary water-cracker, stated that his club had received a similar invitation, but action had been deferred until the wishes of the sister club at Leopard-

ville became known. On motion of Mr. Fogg, the Rev. Hercules Lamb was granted the permission of the floor, and invited to take the seat farthest away from the exposed samples.

The deacon stated that he was in full accord with the scheme, and that such a convention ought to be held at an early date; and he would suggest that at the same time a resolution be offered indorsing the anti-tobacco plank in the Greenback platform, as it would encourage a higher standard of morality among the members of the various clubs throughout the country. The deacon then reached over after a couple of crackers, and in a stage whisper requested Mr. Ross to reach him a few crumbs of cheese, as his throat was dry.

The question was now open for discussion. Mr. Fogg thought it would be a good thing for photography in general, and he was heartily in accord with the plan; further, that he would be willing to be a delegate from the Leopardville Camera Club to the proposed convention, and go to Syracuse or any other place east or west of the Rocky Mountains, provided the club paid his expenses.

Mr. Ross replied that it was customary for delegates to pay their own expenses, as the honor of being a delegate was greater than the paltry outlay involved. This was objected to by our president, who so far had maintained silence, as well as his position between the evaporated fruit and the beef-chipper. He thought that if the parties in the convention expected us to send some of our specimen blue prints to give éclat to their exhibition, and if they wanted the benefit of our experience and experiments, the least they could do would be to pay the expenses of the delegate, and that the president, by virtue of his office, was the proper person to represent the club. This brought the Rev. Hercules Lamb to his feet. Forcing down the remnants of his last cracker, he said that "these were his sentiments exactly," and he said so emphatically in the name of the Turkeytown Tripod Club. Miss Kase now stated that the discussion seemed to be drifting away from the question. At this point a fortunate interruption took place,—Master Fritz had purchased two nickel prize bags of fresh roasted peanuts, one of which he passed around the meeting. After order was restored, and the crackle of the crisp *arachis* had subsided, Mr. Snappschotte, the corresponding secretary, who had broached the subject, stated that the circular set forth the object of the proposed convention, and that the members had certainly gotten away from the subject; that if the proposed organization could be effected it would be a great thing for amateur photography, and no one could foresee the great and lasting results which might result. Conventions would be held, social intercourse promoted, results compared, badges and lapel buttons adopted, exhibitions held, medals, premiums, and diplomas granted; and, who could foretell, perhaps at some future day a monument might be erected to the discoverer of the Cyanotype process? All these things were among the probabilities of the near future. He would therefore make a motion that the secretary of the Leopardville Camera Club be instructed to acknowledge the receipt of the communication, and inform the projectors that the club was in thorough accord with the movement, and would give the scheme the support of the individual members, as well as that of the club as an organization. The motion carried unanimously. Motion was then made to adjourn, to the great relief of the proprietor of the Leopardville cross-roads general store.

J. FOCUS SNAPPSCHOTTE.

TREATING FLEXIBLE PLATES.

WE have ascertained that the use of alum after development produced on flexible plates an effect that rendered manipulation difficult. It was necessary to first learn whether it was the support or the gelatine film that caused cockling.

For this purpose we made several negatives, and we detached the gelatine film from its support. The support remained absolutely flat, consequently it was the gelatine had caused the cockling. But we also discovered that this effect is produced more strongly when the gelatine film has been alumed before or after fixing. We have, therefore, done away with the use of alum. We have also done away with alcohol in the glycerine bath, which produces the same effect as alum, and which may sometimes also shorten the length of our negative.

We want our flexible plate to be able, more than any other preparation, to give scientific results. For this it is necessary that the gelatine film should be rendered absolutely inextendible in the fullest acceptation of the word. To do this we have entirely modified the mode of drying. This is our present mode of operating: The negative, after developing, is washed and fixed. If we have reason to fear the yellow coloration, pass in a both of citric acid at two per cent. before fixing, which is done in a solution of hyposulphite of twenty per cent. After fixing, wash well the flexible plates, and plunge them in a bath composed of:

Water 1 litre.
Glycerine 30 to 40 c.c.

Leave the plates in this bath two hours, or all night if not hurried in the printing. It is absolutely necessary that each negative should absorb a small quantity of glycerine, an operation that has for its object to give it more flexibility. It is well to change the place of the negatives in the dish of glycerinated water, especially if many had been placed together in this dish. This being done, varnish—a very easy operation—with lac varnish and water. This varnish, called hydrophite, is now found almost everywhere. It is poured over the plates whilst they are still wet. The plate is taken from the glycerinated water, and placed on a glass plate rather larger, so that the lower right-hand corner of the flexible plate exactly coincides with the lower right-hand corner of the plate; the gelatine film should be on top, of course. Make the same disposition of a second, then of a third negative, and allow them to drain for about five minutes against the wall. Afterwards take the first and float on the surface a coat of varnish. With a badger blender, or with the finger, direct the liquid so that it covers the whole of the negative, and pour off the excess of varnish into a glass. Give at once a second coating of varnish, which has been placed ready for use on another glass, and pour off the excess into the first glass in order to prevent air-bubbles. Now drain. Each negative should be varnished in this manner. After a drainage of five minutes, raise each plate from the glass on which it is found, place it flat, with the film on top on a sheet of bibulous paper.

All the negatives are thus placed side by side, and allowed to dry on a table. Once dry, the negatives are absolutely plain, and show no tendency to cockle. Moreover, they have undergone neither extension nor shrinking; their dimensions are exactly similar to that of the flexible plate before being placed in the frame.

It is possible to do away with varnishing, but we recommend it very strongly. In this case it is well to sponge the coating on coming from the bath, so that no trace of glycerine remains on the surface of the negative, as the glycerine might, later, at the time of printing on albumenized paper, give rise to spots. But in sponging with a fine sponge, steeped in pure water, and then pressed between the fingers to free it from all excess of water, spotting is no longer to be feared.

MONITEUR.

A NEW PROFESSION FOR WOMEN.—In spectroscopic work (in astronomy) the eye has been superseded of late, to a great extent, by the photographic plate, which is now able to recognize fainter impressions than the eye, and to register them permanently. Professor Pickering has been continuing at Cambridge his remarkable work, and it is also being carried on in the southern hemisphere by a party sent there in connection with the Draper memorial. The instrument employed is a photographic telescope, with a prism or a series of prisms in front of the object-glass, the whole mounted like any large telescope, and provided with an accurate driving clock. With an instrument of this kind we obtain upon the sensitive plate the spectra of all the stars which happen to be in the field of view,—sometimes a hundred at a time, as when a cluster like the Pleiades is in question. This method has made it possible to complete, in a comparatively short time, a general survey of the spectra of all the brighter stars of the northern hemisphere, and the survey is now being extended to the southern hemisphere, where it is already well advanced. Whenever the spectrum of a star, thus photographed on a small scale, is found to present any interesting peculiarity, it is examined with a more powerful instrument, which photographs its spectrum on a much larger scale, and this second photograph is then enlarged again for special study.

It is worth recording here that the examination of the Harvard photographs has been made almost entirely by women, who are assistants in the laboratory. A niece of Dr. Henry Draper, whose memorial is now being erected in the form of this monumental work,—the spectroscopic survey of the heavens,—had the good fortune to discover in the star spectra the delicate doubling of the lines which has proved so full of information.—(*Forum*) PROF. CHARLES A. YOUNG.

THE best "kodacker" in America to-day is Miss Alice Longfellow, daughter of the poet. The finest views of the Massachusetts coast are touched off by her in the stormiest and windiest weather. The result is that she has been the unconscious originator of many pictures hung in line in Boston, and her illustrated storms are at present gracing the title-pages of a book of sea songs.—*New York Truth*.

"I THINK photography is very interesting," she said to a young man who is in that line.

"Yes, it is."

"I should like to have you make a picture of me."

"With pleasure."

"How would you prefer to take me?"

He looked at her with a face that showed deep thought, and then replied, slowly but in a firm voice: "For better or for worse, by all means."—*Washington Post*.

THE following interesting item has been going the rounds of the photographic and secular press:

"A WONDERFUL INVENTION.—Mr. Edison has made another wonderful invention. He attaches an instantaneous photographic camera to his phonograph, plants his two lethal instruments right in front of the orator, and sets them to work. The phonograph records every syllable that falls from his lips, every 'hem and er,' and mispronunciation, while the lightning camera simultaneously photographs eight or twenty times every second the movements of the speakers. Then the photographs are projected by a magic lantern the size of life, the phonograph is set going, and the oration can be delivered ad infinitum."

The above reads like some of the other bulletins which have emanated from the lair of the wizard of Menlo Park. To our mind the announcement seems just a little too previous,—the phonograph part may be all right, so far as we know, but the "lightning camera with its twenty consecutive exposures to the second," and no composites, either;—that is the part, to use an Americanism, "that sticks in our craw." It may be all right; we may be wrong, but before taking much stock in the statement, we should like the privilege of exercising our new £200 Frodsham $\frac{1}{4}$ -second stopwatch on this photographic "Sunol" as it comes in on the home-stretch.

If our memory serves us right samples of similar work were published some months ago by an enterprising daily, but there was a discrepancy noticeable that, at least to our mind, needed an explanation which we have never been able to obtain, viz.: In one of these gesture photographs, the subject had on a pair of striped pantaloons, while in the next in number, said to have been taken one-fourth of a second later, he certainly had on a pair of loud plaids. Although we do not for a moment wish it understood that we doubt the statement, as set forth in the great daily, we must acknowledge that this pantaloon business has made us just a little sceptical.

ADOLPHÉ.

DECOMPOSITION OF EIKONOGEN.—Eikonogen in crystals kept for a long time becomes greenish in color, then black. This partial change does not prevent its use as a developer. The solutions then obtained have a more or less green color, whilst the substance freshly prepared yields solutions of a pale yellow. It is easy to remove from the affected mass the portion which has remained uninjured. Make a cold and very neutral solution of sulphite of soda—that is to say, containing less than 500 grammes of the salt for 1 litre of water; boil, and add an excess of the affected eikonogen reduced to powder. Agitate with a glass rod until complete solution. Decant, and cool rapidly the liquid in a bottle exposed to a flow of cold water and continually agitating, so as to avoid the forming of large crystals of eikonogen, which rapidly crystallizes. Filter the whole and wash the crystals on the filter with a little alcohol. Allow the mass to dry, and we have an eikonogen that is almost colorless.—*Journal des Sociétés Photographique.*

BUSINESS TACT.—Unprepossessing female (to photographer): "How much would you take me for?" Photographer: "About sixteen, madam." He got the job.—*Texas Siftings.*

LITERARY AND BUSINESS NOTICES.

A CORRECTION.—The Eastman Souvenir.—It is with pleasure that we make the following correction. In our notice of the souvenir, in the JOURNAL for September, we stated that the prints were reproductions made by the "Collotype process." We did this only after a careful examination, the pictures being equal to the best results obtained by that process. We did not for a moment suspect there was a possibility of the specimens being "bromides." Such, however, proves to be the case, the company informing us over their signature that they were all made on their regular bromide paper, by direct exposure under the transparent film negatives, and developed with oxalate of potash. In connection with this subject, we here again call the attention of interested parties to our leader in the August JOURNAL; for if results like these can be obtained by advanced amateurs, and the paper remain white, the problem there mentioned certainly seems near a solution.

ANNOUNCEMENT.

NOTICE TO OUR PATRONS.—With the close of the current volume the price of the AMERICAN JOURNAL OF PHOTOGRAPHY will be advanced to 25 cents per copy, or two dollars per year if paid in advance. Commencing with No. 1 of Vol. XII., January, 1891, we expect to present the JOURNAL in an improved form. The pages of reading matter will be increased, so as to more than overbalance the advance of rates, while we shall try, as heretofore, to present such illustrations as will alone be worth more than the subscription price.

It is needless to state that the AMERICAN JOURNAL OF PHOTOGRAPHY is not a trade paper, but a truly independent photographic magazine in all that the name implies, whose pages are jealously guarded, published in the interest of the art exclusively, and not in the interest of any special concern. As a matter of course, our advertising pages are open to all respectable concerns—a fact which is recognized by the reputable trade in general.

THE "AMATEUR PHOTOGRAPHER," a small volume issued by the Rochester Optical Company, of Rochester, N. Y., is verily what the title-page states, viz., "A Complete Guide for Beginners in the Art-Science of Photography." We congratulate Mr. Carlton on the concise and practical manner in which he presents the various topics. The present edition is the seventh, and comes in a revised and enlarged form.

RATHGEBER FÜR ANFÄNGER IN PHOTOGRAPHIEREN UND BEHELF FÜR VORTGESCHRITTENE, Wilh. Knapp-Halle, a. S., publisher.—A handy volume of reference for beginners, by Lieut. Ludwig David, well known as an author in connection with Charles Scolik of Vienna; and as a photographer, by his success with instantaneous photography. This is essentially a beginner's book, for such as are absolutely without any knowledge in photography whatever. The book is profusely illustrated, which in itself is of great value to the beginner. The book is divided into two parts, dealing with the negative and positive processes respectively. We advise our readers to recommend the book to any one wishing to become proficient as an amateur photographer, and at the same time is conversant with the German language.

IN answer to numerous inquiries about our illustration, "The Old Mill on the Crum," we will state that to get out our edition we used five negatives, two of which were the Vogel eoside of silver plates, the others Carbutt orthochromatic, all developed with the new combined formulæ. As the prints from these plates were used promiscuously, it is impossible for us to tell on what plate a particular print was made without seeing it. The Seed plates exposed in these experiments proved a failure under the same conditions. As to the printing, the paper used was the "Shanghai" brand; toning bath, sulphite of soda and borax; lubricator, dry castile soap. In reply to several letters received about the composition of the proposed "orthochromatic" developer we refer our friends to page 265 of the JOURNAL, and ask them to try the formulæ; the more we use it the more we like it. In conclusion, we wish to thank our many friends who have written us congratulatory notes on "Our Illustration."

J. F. S.

WE REGRET to learn, as we are about going to press, that Mr. F. Burrows has severed his connection with the firm of Queen & Co. Mr. Burrows, in addition to his thorough practical knowledge of photography in all its branches, and his inventive genius, being the author of a number of excellent appliances now in use, is an upright, genial gentleman, with whom any one should be glad to become acquainted. We hope that he may soon find an opening in which he can make good use of his talents.